

Department of Linguistics

WHAT IS MEG?

(magnetoencephalography)

MEG measures the magnetic fields generated by the brain whenever information is processed. The brain's magnetic fields are 100 million times smaller than the magnetic field of the earth - so it is like trying to measure the footsteps of an ant, at a rock concert. Extremely sensitive sensors (SQUIDS) are used to measure these tiny magnetic fields. There are 160 sensors in the adult MEG system, bathed in liquid helium at -267° Celsius.

A child MEG system

In July 2008, the world's first wholehead child MEG system was installed, with 64 sensors. This system is specially designed to measure brain activity in children without requiring them to make conscious decisions. For example, we can see how children's brains respond when they are reading or listening to real words vs non-words (e.g., cake vs dake).

Benefits of MEG

- We can observe brain activity in real time, with millisecond accuracy (unlike MRI).
- We can identify the source of brain activity within 3mm.
- MEG is completely safe and non-invasive.
- Easier set up than EEG.
- A parent can be with their child during testing.



Auditory processing using MEG

When the human brain hears a 1kHz tone, a characteristic peak in activity is found 100ms after the tone. By superimposing the magnetic activity on a structural MRI (see below), we can localise the source of auditory processing.

